

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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International Patent Classification (IPC) or national classification and IPC G11B7/006, G11B20/12			
Applicant DEUTSCHE THOMSON-BRANDT S.A. et al.			
<p>1. This report is the International preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 12 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 5 sheets, as follows:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the opinion</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input checked="" type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul>			
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## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements\* of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

### Description, Pages

1-15 as originally filed

### Claims, Numbers

1-12 filed with telefax on 19.05.2005

### Drawings, Sheets

1/8-8/8 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos. 13
  - the drawings, sheets/figs
  - the sequence listing (specify):
  - any table(s) related to sequence listing (specify):
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (specify):
  - any table(s) related to sequence listing (specify):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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## Box No. IV Lack of unity of invention

1.  In response to the invitation to restrict or pay additional fees, the applicant has:
  - restricted the claims.
  - paid additional fees.
  - paid additional fees under protest.
  - neither restricted nor paid additional fees.
2.  This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
  - complied with.
  - not complied with for the following reasons:  
**see separate sheet**
4. Consequently, this report has been established in respect of the following parts of the international application:
  - all parts.
  - the parts relating to claims Nos. .

## Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Yes:	Claims	2-10
	No:	Claims	1, 11, 12
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-12
Industrial applicability (IA)	Yes:	Claims	1-12
	No:	Claims	

### 2. Citations and explanations (Rule 70.7):

**see separate sheet**

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**Re Item IV**

**Lack of unity of invention**

The present invention contains the following 3 separate inventions:

1. Claims 1-8 relating to the rewriting strategy of an optical rewritable disc, solving the problem of having quick deterioration of often overwritten disc sectors.
2. Claims 9-10 relating to serving concurrent search operations accessing a database file, solving the problem of handling multiple overlapping search requests to a database file.
3. Claims 11-12 relating to the distinction between valid and invalid records in a database file based on version numbers contained in the records, solving the problem of being able to identify invalid database records.

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) since neither their features, nor their problems solved have a common inventive concept. The only concept that appears to be common in all 3 inventions, is the concept of relating to a database file. The additional concept that appears to be in common between inventions 1 and 3 is that the data is stored with a wrap-around technique. The inventions have no further features in common.

Invention 1 writes and rewrites this database file to an optical disc, insuring an even distribution of the number of times a disc segment is being written and rewritten.

Invention 2 deals with concurrent access to this database file, independent of where and how it is stored.

Invention 3 insures valid database records of this database file using version numbering, independent of the deterioration of disc sectors and independent of any concurrent access to the database file.

The concept of a database file has been known for decades to the person skilled in the art, and thus cannot be seen as inventive. The concept of wrap-around is common day practice since any hard-disc uses wrap-around techniques. Therefore, there is no single general concept which is inventive, hence there is no single general inventive concept according to Rule 13.1 PCT.

Furthermore, the common features cannot be seen as common or corresponding

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Special Technical Feature within the meaning of Rule 13.2 PCT, because on the one hand, the features are well-known, and on the other hand, the problems solved by the inventions (see above) are each distinct and independent from the others because they are solved independently from each other and cannot said to represent corresponding underlying objective problems.

In conclusion, the 3 groups of claims are neither linked by a single general inventive concept, nor by common or corresponding Special Technical Features, and thus define 3 different inventions. Hence, the application does not meet the requirements of Unity of Invention as defined in Rule 13.1 and 13.2 PCT.

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following documents:

- D1: US 6,580,683 B (Braitberg et al.) 17.06.2003
- D2: US 4,815,062 A (Suzuki) 21.03.1989
- D3: US 5,454,105 A (Hatakeyama et al.) 26.09.1995
- D4: US 2003 135520 A1 (Mitchell et al.) 17.07.2003
- D5: US 6,125,371 A (Bohannon et al.) 26.09.2000

2.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (*the references in parentheses applying to this document*) the following features:

A method for modifying a database file organized in segments and stored on a storage medium ~~of limited rewritability~~ (*column 3, lines 34-40*), the method containing the steps of:

- 1 reserving, within the database file, at least one area of predetermined size and position dedicated to writing thereto data records of at least one type, respectively (*column 3, lines 37-40; column 12, lines 43-62*);
- 2 indicating within the database file, as a last written segment within the area

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- to which data records were last written (*this feature is implicit, as D1 mainly refers to write-once media; on a write-once media, to execute multiple subsequent recordings, last written segments have to be indicated in order that the recorder can start recording on the next available position*);
- 3 ensuring distributed write in that, whenever a data record of a specific type is to be written to the database, the writing uses, within the area dedicated to the specific type, the next available segments after the last written segment (*this feature is implicit, as D1 mainly refers to write-once media; on a write-once media, subsequent data is always written on the next available segment*);
- 4 ~~continuing, whenever during the writing the end of the area has been reached, the writing at the first available segment of the area.~~

2.2 The subject-matter of claim 1 therefore appears to differ from this known D1, represented by the crossed-out terms above, in that:

- A the storage medium is rewritable (it should be considered that any rewritable medium is of "limited" rewritability);
- B continuing, whenever during the writing the end of the area has been reached, the writing at the first available segment of the area.

Regarding feature A, D1 also suggests (*column 3, lines 40-42; column 4, line 16*) that rewritable media could be used. The term "preferable write-once" is only a preference, but also includes re-writeable media.

Regarding feature B, D1 does not suggest any different way of recording for the re-writeable media. Consequently, the re-writeable media in D1 is recorded in the same fashion as the write-once media, i.e. when during the writing the end of the area has been reached, the write process starts all over again, from the beginning of the area, and thus only writes at the first available segment of the area.

As a result, features A and B can also be considered disclosed in D1.

These are all features of claim 1, thus the subject-matter of claim 1 is not novel (Article 33(2) PCT).

2.3 Even if the above mentioned differentiating features would be considered not to be

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disclosed in D1, although the subject-matter of claim 1 would then be novel (Article 33(2) PCT), it would not be considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

The skilled person of D1 would at a certain moment pose the question of how to apply the knowledge of D1 to the very common rewritable media, in order to be more flexible.

In solving this problem, the skilled person would realise that for the initial recording, there is no difference between the write-once and the rewritable media, and thus would proceed in the same fashion, as is suggested by D1 (*column 4, line 16*), and would sequentially write onto the media.

However, a difference occurs when it is desired to delete or modify already written data. Therefore, the above problem which the skilled person would pose should be reformulated into how to execute deletions and modifications on the media.

Rewritable media have been popular for decades and the problem of damaged segments has been known since then. Numerous solutions have been proposed, all applicable to different circumstances, and it is a well-known principle that to avoid a particular segment to be damaged early due to overuse, there should be an evenly distributed wear of all segments.

As a result, the solution proposed in the current claim 1 is considered to be just a mere choice by the skilled person, made depending on the circumstances without inventive skill or surprising technical effect.

2.4 A similar reason as in paragraph 2.3 could be applied using document D2 as a basis and also resulting in the fact that the subject-matter of claim 1 is not considered to involve an inventive step (Art. 33(3) PCT).

3. Dependent claims 2-8 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Art. 33(3) PCT), the reasons being as follows:

The claims all relate to minor implementation details which the skilled person

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would implement according to the circumstances, without inventive skill or surprising technical effect.

**4.1 In regard of independent claim 9, the following should be considered:**

- 1 A large collection of books relating to e.g. the topic of art can be considered analogous to a database file containing a number of documents, i.e. the books relating to art. A person looking for a present for a favourite friend would search through the collection of books, possibly sequentially and one by one, to find the books that fulfill the search criterion, i.e. the books about a certain topic, for example all books relating to the painter *Monet*.
- 2 In the mind of the person searching, it will say "I'm doing one search, searching for one search criterion", which corresponds to the active search counter being incremented upon the launch of a new search operation to test a specific criterion (*Monet*).
- 3 While looking for *Monet*, it could occur to the person that the painter *Pissaro* would also be very pleasing as a present. As a result, the person would then continue to search for two search criteria, looking at the books sequentially and one by one. In the mind of the person, it would now say "Attention, I'm doing two searches now, I need to search for two search criteria". The person would proceed analogously when more search criteria come to mind at different other times, each time incrementing the mental active search counter. It is evident, that it would require (*in one of the obvious options*) the person to restart the search at the beginning of the documentation after finishing the current search cycle each time one or more search criteria were added during the current search cycle, to also cover the part of the documentation which had not been searched yet for a particular search criterion, thus resulting in a consecutive and cyclical search.
- 4 Of course, the person would find a way to memorize the place when each of the searches were started, in order that none of the searches are executed more than once on the same part of the documentation. One of the easiest and obvious ways to memorize the place where the search was started is where the first book of that search was taken out.
- 5 During the search, the person will notice when the end of the search for one search criterion has arrived, by arriving at the place where the first

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book was taken out fulfilling the search criterion of this particular search. The person will thus stop searching for this criterion, decrementing the mental active search counter. If there are still some search criteria for which the whole documentation has not been scanned, the consecutive and cyclical search will continue.

- 6 When the searching person has decremented the mental active search counter to zero, because the last search criteria has just been completed on the whole documentation, the person will terminate the document retrieve process.

Although not all persons searching for a present in the form of a book would search in the above systematic way, it certainly would be done by a person, depending on the circumstances, with no inventive skill and no surprising effect.

Consequently, the closest prior art is thus taken to be the way a human being searches for a document in a large set of organised documents (analogous to T0634/01 - Method of extracting images/Fuji), as indicated in the above steps 1-6. Thus the claimed method amounts to nothing more than the mere idea of automating human behaviour. As a result, claim 9 is the computerized implementation of an obvious method, which is trivial for the skilled person in computers and data retrieval. Therefore, the subject-matter of claim 9, although novel according to Article 33(2) PCT, cannot be considered to be inventive according Article 33(3) PCT.

**4.2** Independent of the above, document D3 is regarded as being the closest prior art to the subject-matter of claim 9, and shows (*the references in parentheses applying to this document - a general understanding of the document needs to be developed first to fully understand the passages*) the following features:

A method of serving concurrent search operations accessing a database file containing a number of documents (*see abstract; concurrent search requests which arrive while the current search operation (of other concurrent search requests) is running are stored in a queue buffer; when the current search operation is finished, then all concurrent search requests in the queue buffer are treated at the same time, which will then become the present search operation*), the method containing the steps of:

- incrementing, upon the launch of a new search operation to test a specific criterion on the documents in the database, an active search counter (*column 11,*

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*lines 35-36; every time a new request is received and entered in the queue, the queue counter is incremented, thus counting the number of concurrent searches to be executed once the present search operation has finished);*

- launching, in case the active search counter has a value indicating that one or more search operations are active and a document retrieve process is not yet running, the document retrieve process which consecutively and cyclically retrieves the documents contained in the database and provides them to any active search operation (*column 3, lines 20-29; the search is a string search, column 4, lines 36-40; the search is also cyclical as from search queue to search queue, the same documentation is scanned over and over again*);
- memorizing, in the launched new search operation receiving documents from the document retrieve process, as a first document an identifier of the document received first after launch, and applying the specific criterion on the received documents (*all retrieved documents are memorized, thus also the first; column 2, lines 41-43; column 3, lines 56-67*);
- terminating, in case the search operation receives the first document a second time, the search operation and decrementing the active search counter (*only one scan of the document data is performed, then the search for a particular queue is terminated; column 4 lines 36-40*);
- terminating, in case the active search counter has a value indicating that no more search operations are active (*no more search requests in the search queue buffer*), the document retrieve process (*it is implicit that no more searches are executed if there are no more searches in the search queue buffer*).

Claim 9 differs from D3 by the crossed-out features as indicated above. The difference can be interpreted as follows:

- no search queue buffer, but direct start of search of incoming search requests
  - consequently, no queue counter needed, but an active search counter
  - consequently, individual indication per search request of termination of each search request needed

The last two features are dependent on the first. Since an incoming search request is immediately executed in combination with the already running search requests, the system needs to know how many searches are active, and needs an individual indication per search request when to terminate it.

The subject-matter of claim 9 is therefore novel (Art. 33(2) PCT).

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A skilled person of D3 would at one point or another prefer to directly treat search requests rather than putting them into a queue for delayed processing as in the first aspect of D3's invention (column 2, line 3 - column 4, line 43). The prerequisites for doing this are already in D3, as D3 (in the first aspect of the invention) already shows how to treat parallel searches, and searches through the database file in a consecutive and cyclical fashion from queue to queue. The skilled person will realize that the queue counter of D3 will be superfluous and that an indication of the number of parallel searches is needed. The skilled person will further realize that in order to implement the direct processing, a mark is needed in the documentation to indicate when a search for a particular criterion has started, and when it should be finished. The fact that a skilled person will realize these two matters is not the least because this way of searching is so close to the way a person would scan through e.g. a library in search for multiple search criteria occurring at different times, as indicated above under point 4.1.

An active search counter and memorizing the first document found in response to applying a new search criterion are just mere choices which a skilled person would select, under the circumstances, without inventive skill or surprising technical effect to solve the problems posed.

As a result, the skilled person would arrive from D3 (the first aspect of its invention) at the features of independent claim 9, whose subject-matter is thus not considered inventive under Article 33(3) PCT.

4.3 It should be noted that the reasoning under 4.1 is completely independent from the reason under 4.2. Both reasonings independently are sufficient to show that although the subject-matter of claim 9 is novel, it is not considered to be inventive.

4.4 Dependent claim 10 on the one hand is disclosed by D3 (Fig. 5; column 2, lines 32-33), and on the other hand is considered trivial, as a database (and corresponding search engine) will treat each search request independent from its origin. As a result, the subject-matter of claim 10 is not considered to involve an inventive step (Art. 33(3) PCT).

5.1 Document D5 is regarded as being the closest prior art to the subject-matter of claim 11, and shows (*the references in parentheses applying to this document*) the following features:

- A data carrier having stored thereon a database file containing records, characterized in that (*abstract*)

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- each record contains one distinct version number information monotonically related to the time when the record was written to the data carrier (*abstract; the version number relates to when the* ), and
- stored with wrap-around in a fixed wordlength data field (*these features are implicit in D5 - the data in D5 is stored on re-writeable data carriers; all re-writeable data carriers use wrap-around techniques*).

These are all the features of claim 11, thus its subject-matter is not considered novel (Art. 33(2) PCT).

5.2 The feature of dependent claim 12 is the exact reason to have a version number, to be able to identify valid records. As a result, this feature is implicitly disclosed by D5, and the subject-matter of claim 12 is thus not novel (Art. 33(2) PCT).

5.3 The same reasoning in regard to claims 11 and 12 can be followed using D4 (*see its abstract*), rendering the subject-matter of claims 11 and 12 not novel (Art. 33(2) PCT).

## REPLACEMENT SHEET 1

Claims

1. A method for modifying a database file (31) organized in segments (32) and stored on a storage medium (12) of limited rewritability, the method containing the steps  
5 of:

- reserving, within the database file, at least one area (42, 43, 44) of predetermined size and position dedicated to writing thereto data records (D1...D8) of at least one type, respectively;
- indicating within the database file, as a last written segment (S2) that segment within the area to which data records were last written;
- writing a specific data record of a specific type that is to be written to the database, into the next available segment or segments after the last written segment within the area dedicated to the specific type;

characterized by a step of:

- continuing, whenever during the writing the end of the area has been reached, the writing at the first available segment of the area.

2. The method of claim 1, used for modifying a data record (D1...D8) of a specific type in the database file (31), wherein the database file contains an area dedicated to the specific type, and the method contains the steps  
25 of:

- reading, from the area, the data record;
- modifying the read data record;
- obtaining a first write address information indicating a segment (S2) within the area to which a data record of the specific type was last written;
- forwarding, as part of ensuring distributed write, the first write address information so that it

## REPLACEMENT SHEET 2

indicates a next segment (S3) within the area which contains unused space;

- writing the modified data record to segments starting at the segment as indicated by the first write address information.

5

3. The method of claim 2, wherein the data record is a payload data record (73), the specific type is a "payload" type, the area is a payload area (44), the database file additionally has a control area (42), and wherein the method additionally contains the steps of:

10

- in case that an address information about the payload data record is contained in a control block (53) within the control area, reading, from the control area, the control block;

15

- updating the address information in the control block to reflect the first write address;
- obtaining a second write address information indicating the segment within the control area to

20

which a control block was last written;

- forwarding, as part of ensuring distributed write, the second write address information so that it indicates a next segment within the control area which contains unused space;

25

- writing the updated control block to the segment as indicated by the second write address information.

4. The method of claim 1, used for deleting a payload data record (73) from the database file (31), wherein the database file contains a control area (42), and the method contains the steps of:

30

- reading, from the control area, control blocks (53) containing information associated to the payload data record to be deleted;

## REPLACEMENT SHEET 3

- marking, in the read control blocks, the payload data record to be deleted as deleted, thereby obtaining a modified control block;
- obtaining a write address information indicating the segment within the control area to which a control block was last written;
- forwarding, as part of ensuring distributed write, the write address information so that it indicates a next segment within the control area which contains unused space;
- writing the modified control block to the segment as indicated by the forwarded write address information.

15 5. The method of any previous claim, wherein the size of the segments corresponds to an integer multiple of the size of sectors or ECC blocks as defined in a physical format on the storage medium (12).

20 6. The method of claim 5, wherein the segments are allocated on the storage medium to be sector or ECC block aligned.

25 7. The method of any previous claim, wherein the indicating is realized by attaching to a data record to be written a version count value which is incremented and taken modulo a predefined upper bound upon each writing, the version count getting written to the database file as part of the data record being written thereto.

30 8. The method of any previous claim, wherein the size of the at least one area (42, 43, 44) is chosen such that the average wear of the segments is equal.

## REPLACEMENT SHEET 4

9. A method for serving concurrent search operations (22...26) accessing a database file containing a number (z) of documents, the method containing the steps of:
- 5     - incrementing, upon the launch of a new search operation to test a specific criterion on the documents in the database, an active search counter (27, 28);
- 10    - launching (Start), in case the active search counter has a value indicating that one or more search operations are active and a document retrieve process (21) is not yet running, the document retrieve process which consecutively and cyclically retrieves (29) the documents contained in the database and provides them to any active search operations;
- 15    - memorizing, in the launched new search operation receiving documents from the document retrieve process, as a first document an identifier of the document received first after launch, and applying the specific criterion on the received documents;
- 20    - terminating, in case the search operation receives the first document a second time, the search operation and decrementing the active search counter;
- 25    - terminating (End), in case the active search counter has a value indicating that no more search operations are active, the document retrieve process (21).
- 30 10. The method of claim 9, wherein the search operations originate from different sources.

REPLACEMENT SHEET 5

11. A data carrier having stored thereon a database file (31) containing records (D1...D8), characterized in that each record contains one distinct version number information monotonically related to the time when the  
5 record was written to the data carrier and stored with wrap-around in a fixed wordlength data field.
12. The data carrier of claim 11, additionally characterized in that only that record is predefined to  
10 be considered valid, for which the subsequent record does not bear the subsequent version number.